Bureau of Beaches and Coastal Systems

STRATEGIC BEACH MANAGEMENT PLAN

May 2008

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STATE OF FLORIDA
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CERTIFICATE OF ADOPTION

WHEREAS the Florida Legislature has declared that the Department of Environmental Protection constitutes the beach and shore preservation authority for the state, and

WHEREAS the Florida Legislature has directed the Department to develop and maintain a comprehensive long-term management plan for the restoration and maintenance of the state's critically eroded beaches fronting the Atlantic Ocean, Gulf of Mexico and Straits of Florida, and

WHEREAS the Department has developed a Strategic Beach Management Plan, incorporating by reference adopted Inlet Management Implementation Plans, and held public meetings in the areas for which the plan has been prepared, in accordance with Sections 161.091, 161.101, and 161.161, Florida Statutes, and,

WHEREAS the Department initially adopted the Strategic Beach Management Plan (Plan) in October 2000, and has subsequently updated the Plan to reflect current conditions and management strategies,

The Department does hereby adopt the Strategic Beach Management Plan.

This plan is based upon the supporting data referenced in the plan or contained within files of the Department. Each strategy contained in this plan is subject to further evaluation, and subsequent authorization, as part of the Department's environmental permitting and authorization process.

The strategies identified in this plan shall be eligible for state financial participation subject to Department approval and appropriation from the Florida Legislature. The level of state funding shall be determined based upon the activity being conducted, Florida Statutes and Department rules. The Department may choose not to participate financially if the proposed method for implementation is not cost effective or fails to meet the intent of Chapter 161, Florida Statutes. Nothing in this plan precludes the evaluation and potential adoption of other alternative strategies which are consistent with Chapter 161, Florida Statutes.

APPROVED FOR ADOPTION

Michael R. Barnett, P.E., Chief
Bureau of Beaches and Coastal Systems
Department of Environmental Protection

5/21/08
Date

STATE OF FLORIDA

STRATEGIC BEACH MANAGEMENT PLAN

INTRODUCTION

Beaches are dynamic land forms at the edge of the ocean or Gulf of Mexico subject to both natural and man-induced erosion. Sand moves along the shore due to wind driven currents and tides, and storms can cause dramatic changes to the beach. The majority of man-induced erosion is due to the creation and maintenance of inlets, where the sand has historically been removed from the coastal system, and the natural drift of sand along the shore is blocked by jetties, trapped in channels, or moved into ebb and flood shoals. Development and the placement of infrastructure too near the shore has also contributed to coastal erosion by limiting the amount of sand stored in dunes and hardening the shore in order to protect upland property.

Florida depends on its 825 miles of sandy beaches fronting the Atlantic Ocean, Gulf of Mexico and Straights of Florida for the enjoyment of its residents and tourists. Beaches are Florida's primary tourist attraction, generating millions of dollars for Florida's economy. Beaches provide habitat for many species, including endangered and threatened marine turtles, birds and mammals. Beaches also provide storm protection for upland property and public infrastructure.

The Florida Department of Environmental Protection (FDEP) has developed a multiyear repair and maintenance strategy to carry out the state responsibilities of a comprehensive, long-range, statewide program of beach erosion control; beach preservation, restoration, and nourishment; and storm and hurricane protection. The principles of this strategy are to:

- Maximize the infusion of beach-quality sand into the coastal system;
- Implement those projects that contribute most significantly to addressing the state's beach erosion problems;
- Promote inlet sand bypassing to replicate the natural flow of sand interrupted by improved, modified or altered inlets and ports;
- Extend the life of beach restoration projects and reduce the frequency of nourishment;
- Encourage regional approaches to ensure the geographic coordination and sequencing of projects; and
- Reduce equipment mobilization and demobilization costs.

The Strategic Beach Management Plan (SBMP) documents the specific strategies for constructive actions at critically eroded beaches and inlets consistent with these principles. Projects must have a clearly identifiable beach management benefit consistent with the SBMP to be eligible for state funding assistance. Resources and opportunities to achieve the strategic goals of the program are discussed in the context of a subregion defined by the boundaries of distinct coastal littoral processes. In addition, the SBMP provides a summary of previous actions taken to address beach erosion within each subregion.

Inlet management plans adopted by FDEP are incorporated into the SBMP by reference along with other inlet management strategies. Feasibility studies conduced by local governments, federal and state studies and reports, and the study reports authorizing federal shore protection projects are incorporated by reference. The *Critically Eroded Beaches in Florida* report, which is updated by the FDEP's Bureau of Beaches and Coastal Systems annually, lists those segments of shoreline designated by FDEP as

critically eroded, and therefore eligible for state funding assistance for beach management activities. Project cost estimates and schedules may be found in the Florida Beach Management Program - Long Range Budget Plan.

The SBMP is a dynamic management tool for use by state, local and federal government officials. It is intended to be updated periodically as specific strategies are implemented, new resources and opportunities are identified, and proposed strategies are developed by FDEP and federal or local government sponsors. The SBMP document is available on the FDEP Bureau of Beaches and Coastal Systems' website (http://dep.state.fl.us/beaches/) with limited paper copies distributed to key stakeholders or available upon request. In addition, the *Critically Eroded Beaches in Florida* report, the Florida Beach Management Program - Long Range Budget Plan, and adopted Inlet Management Implementation Plans are published on the website.

PERMITTING

All projects proposed to implement the SBMP strategies must obtain the appropriate federal and state permits and authorizations and must comply with local comprehensive plans and ordinances. Applicants must demonstrate that the project will comply with Florida's water quality standards and must protect threatened and endangered species as required in Biological Opinions issued by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Projects must also comply with the authorities of the Florida Fish and Wildlife Conservation Commission, the Florida Division of Historical Resources in the Department of State, and other state agencies as incorporated in the Florida Coastal Zone Management Program.

Permitting considerations typically include an assessment of the compatibility of sand proposed to be utilized with the existing beach; project dimensions that may adversely effect nearshore hardbottom, or allow additional lighting on the beach that could affect marine turtle nesting and hatchlings; turbidity levels at the borrow site and placement site; and seasonal windows of construction and construction management to protect marine turtles, manatees, Gulf sturgeon, and nesting and migrating shorebirds. Projects in or near Aquatic Preserves and other Outstanding Florida Waters must comply with more stringent state water quality standards.

MANAGEMENT OVERVIEW

At present, about 391.5 miles of sandy beaches and 8.8 miles of inlet shoreline are designated critically eroded, a condition where previous or continuing erosion threatens private or public development and infrastructure, or significant cultural or environmental resources. Of those beaches classified as critically eroded, the Department has under active management 197.8 miles. A listing of the critically eroded beaches under active management is provided on the following pages.

There are 21 inlets along the east coast and 40 inlets along the west coast of Florida. Active management to mitigate the erosive impacts of many of these inlets to the adjacent beaches has been implemented. Active management includes beach and dune restoration, beach nourishment, and feeder beaches or inlet sand bypassing and other actions to mitigate the erosive effects of inlets.

MILES OF CRITICALLY ERODED BEACHES
UNDER ACTIVE MANAGEMENT

Region, Subregion and Project	***County***	***Location***	**Miles**	***Federal Authorization***
Northeast Atlantic Coast Region				
Sea Islands Subregion				
South Amelia Island Beach Restoration Project	Nassau	R60-R80	3.1	No
Duval County Shore Protection Project	Duval	R32-R80	10.1	Yes
St. Johns Beaches Subregion				
St. Johns County Shore Protection Project	St. Johns	R132 -R151	3.8	Yes
Central Atlantic Coast Region				
Cape Canaveral Subregion				
Brevard County Shore Protection Project – North Reach	Brevard	R1-R53	9.4	Yes
Patrick Air Force Base Beach Restoration Project	Brevard	R53-R75.3	4.0	Yes
Brevard County Shore Protection Project – South Reach	Brevard	R118-R139	3.8	Yes
Indian River Coast Subregion				
Ambersand Beach Restoration Project	Indian River	R1-R17	3.1	No
Indian River County Sector Seven Beach Restoration Project	Indian River	R97-R108	2.2	No
St. Lucie Beaches Subregion				
Fort Pierce Shore Protection Project	St. Lucie	R34-R41	2.3	No
Treasure Coast Subregion				
Martin County Shore Protection Project	Martin	R1-R25.6	4.2	Yes

St. Lucie Inlet Management Plan Implementation	Martin	R50-R55	1.0	Yes
Jupiter Island Beach Restoration Project	Martin	R75-R115	6.8	No
Southeast Atlantic Coast Region				
Northern Palm Beaches Subregion				
Jupiter-Carlin Park Beach Restoration Project	Palm Beach	R13-R19	1.1	Yes
Juno Beach Restoration Project	Palm Beach	R26-R38	2.4	No
Palm Beaches Subregion				
Lake Worth Inlet Management Plan Implementation	Palm Beach	R76-78	0.6	Yes
Mid-Town Beach Restoration Project	Palm Beach	R90.4-R101.4	2.5	No
Phipps Ocean Park Beach Restoration Project	Palm Beach	R116-R126	1.4	No
Ocean Ridge Beach Restoration Project	Palm Beach	R152-R159	1.6	Yes
Southern Palm Beaches Subregion				
Delray Beach Restoration Project	Palm Beach	R175.5-R188	2.7	Yes
Boca Raton (North) Beach Restoration Project	Palm Beach	R205-R212	1.5	Yes
Boca Raton (Central) Beach Restoration Project	Palm Beach	R216-R222	1.5	No
Boca Raton (South) Beach Restoration Project	Palm Beach	R223-R227.9	1.0	No
Broward-Dade Beaches Subregion				
Hillsboro Beach Restoration Project	Broward	R6-R12	1.2	No
Broward County Beach Erosion Control Project Segment II	Broward	R25-R53	5.4	Yes
John U. Lloyd State Park Beach Restoration Project	Broward	R86-R94	1.6	Yes

Broward County Beach Erosion Control Project Segment III	Broward	R101-R128	5.3	Yes
Dade County Shore Protection Project, Sunny Isles	Miami-Dade	R7-R20	2.6	Yes
Dade County Shore Protection Project, Bakers Haulover Park	Miami-Dade	R20-R26.7	1.6	Yes
Dade County Shore Protection Project, Bal Harbor, Surfside, Miami Beach	Miami-Dade	R27-R74.4	9.4	Yes
Southern Barriers Subregion				
Key Biscayne Shore Protection Project	Miami-Dade	R101-R113	2.4	Yes
Florida Keys Region				
Curry Hammock State Park Beach Restoration Project	Monroe	na	0.1	No
Bahia Honda State Park Beach Restoration Project	Monroe	na	0.5	No
Smathers Beach Restoration Project	Monroe	na	0.6	No
Fort Zachary Taylor Historical State Park Beach Restoration Project	Monroe	na	0.3	No
Panhandle Gulf Region				
Western Barriers Subregion				
Pensacola Beach Restoration Project	Escambia	R107-R151	8.2	No
Navarre Beach Restoration Project	Santa Rosa	R192-R213.5	4.1	No
Destin-Western Walton Beach Restoration Project	Okaloosa	R39-R50	2.1	No
Pleistocene Mainland Subregion				
Destin-Western Walton Beach Restoration Project	Walton	R1-R23	5.0	No
St. Andrews Reach Subregion				
Carrillon Beach and Pinnacle Port Beach Restoration Project	Bay	R1-R5	1.5	No

Panama City Beach Shore Protection Project	Bay	R5-R91.5	16.2	Yes
St. Andrews Inlet Management Plan Implementation	Bay	R91.5-R97	0.9	Yes
Big Bend Gulf Coast Region				
Sun Coast Subregion				
Fort Island Gulf Park Beach Restoration Project	Citrus	na	0.2	No
Southwest Gulf Coast Region				
Pinellas Barriers Subregion				
Honeymoon Island State Park Beach Restoration Project	Pinellas	R8-R10.5	0.5	No
Pinellas County Beach Erosion Control Project-Sand Key	Pinellas	R56-R66	1.8	Yes
Pinellas County Beach Erosion Control Project-Sand Key	Pinellas	R71-R107	6.8	Yes
Pinellas County Beach Erosion Control Project-Treasure Island	Pinellas	R126-R143	3.5	Yes
Pinellas County Beach Erosion Control Project-Long Key, Upham Beach	Pinellas	R144-R148	0.7	Yes
Pinellas County Beach Erosion Control Project-Long Key, Pass-a-Grille	Pinellas	R160-R166	0.9	Yes
Sarasota Barriers North Reach Subregion				
Manatee County Shore Protection Project, Anna Maria Island	Manatee	R7-R26	5.3	Yes
Sarasota County Shore Protection Project, Longboat Key	Manatee	R44-R67	4.4	No
Sarasota County Shore Protection Project, Longboat Key	Sarasota	R1-R29	5.4	No
Lido Key Shore Protection Project	Sarasota	R35-R43.2	1.8	Yes
Sarasota Barriers South Reach Subregion				
South Siesta Key Beach Restoration Project	Sarasota	R67-R77	2.1	No

Sarasota County Shore Protection Project, Venice	Sarasota	R116-R133	3.3	Yes
Manasota Barriers Subregion				
Charlotte County Beach Restoration Project	Charlotte	R28-R39	1.8	No
Charlotte Harbor Complex Subregion				
Lee County Shore Protection Project, Gasparilla Island	Lee	R10-R26	3.2	Yes
Lee County Shore Protection Project, Captiva Island	Lee	R84-R109	5.0	Yes
Sanibel Island Beach Restoration Project	Lee	R109-R118	1.7	No
Sanibel Island Beach Restoration Project, Gulf Pines Subdivision (private)	Lee	R129-R133	0.9	No
Estero Barriers Subregion				
Lovers Key State Park Beach Restoration	Lee	R115-R120	1.2	No
Bonita Beach Restoration Project	Lee	R226-R230.4	0.9	No
Naples Coast				
Collier County Beach Restoration Project, Vanderbilt Beach	Collier	R22.3-R30.5	1.6	No
Collier County Beach Restoration Project, Park Shore	Collier	R50.65-R57.5	1.3	No
Collier County Beach Restoration Project, City of Naples	Collier	R57.8-R79	3.4	No
City of Naples Erosion Control Structures	Collier	R88-89	0.2	No
Southern Barriers				
Central Marco Island Beach Restoration Project	Collier	R134.5-R139	0.8	No
South Marco Island Beach Restoration Project	Collier	R143-148	0.9	No

CRITICALLY ERODED MANAGED SHORELINE BY REGION

REGION	CRITICALLY ERODED SHORELINE (Miles)	CRITICALLY ERODED MANAGED SHORELINE (Miles)	% MANAGED
Northeast Atlantic Coast	27.7	17.0	61
Central Atlantic Coast	106.5	34.8	33
Southeast Atlantic Coast	69.3	43.4	66
Florida Keys	10.2	1.5	15
Panhandle Gulf	77.6	38.0	49
Big Bend Gulf	3.7	0.2	18
Southwest Gulf	96.5	62.9	65
TOTAL	**391.5**	**197.8**	**58.1**

SAND SOURCES

The Department has initiated the Regional Offshore Sand Search (ROSS) project to identify and collect information on offshore sand sources to meet the needs of future projects. The regional sand search and inventory information is contained in a database (http://ross.urs-tally.com/) to provide a comprehensive tool that can be used by coastal engineers, project managers, and regulators for the reconnaissance level identification and assessment of potential offshore sand resources suitable for beach restoration projects. The tool consists of a corporate database that can be addressed, searched and manipulated through an online query builder as well as with existing ArcIMS Geographic Information System (GIS) routines that provide access over the Internet. The final phase of the ROSS project will include a reconnaissance level field investigation to bridge data gaps throughout the state of Florida. The U.S. Department of the Interior Minerals Management Service (MMS) is responsible for the use of offshore sand resources located outside of state waters and within federal waters on the Outer Continental Shelf. MMS has initiated regional management of sand sources, where feasible, to manage the growing need for these sand sources. Projects in Collier County, Brevard County, and Duval County have obtained sand sources through the MMS leasing program. The Department encourages coordination of sand sources within each region of the state.

A regional sediment management strategy that uses beach quality sand from upland dredged material management areas and the maintenance dredging of navigation projects should be incorporated into the maintenance of all appropriate beach restoration projects.

MONITORING PROGRAMS

The Department conducts a Statewide Coastal Monitoring Program to collect and process beach and offshore profile survey data and aerial photography for one-quarter of the state's sandy coast each year. Monitoring of beach and inlet management projects is incorporated into regional monitoring activities to avoid duplication. Physical and environmental monitoring programs are being conducted at ongoing and recently completed projects. The Department cost shares in physical and environmental monitoring programs that are required by state and federal permits.

Physical monitoring consists of the collection and analysis of topographic and bathymetric surveys of the beach and dune system, inlet channels and shoals, and the nearshore and offshore zones to the depth of active littoral sand transport in the area. Physical monitoring is used to assess and manage beach erosion control projects and inlet sand bypassing projects, to track shoreline position and volumetric changes to document

performance and nourishment intervals, and to validate the sediment budget for littoral sand transport through the area..

Environmental monitoring consists of the collection and analysis of nesting and hatching data for marine turtles, shorebirds, density and diversity of epibiotic species on nearshore hardbottom and artificial reefs, and some fish surveys. Environmental monitoring is used to assess the effects of beach erosion control projects and the success of artificial reefs required as mitigation for project impacts.

INNOVATIVE TECHNOLOGIES

The Department is directed to periodically review innovative technologies for beach erosion control and, on a limited basis, authorize, through the permitting process, experimental projects that are alternatives to traditional projects to determine the most effective and less costly techniques. The Department is authorized to co-sponsor demonstration projects of new or innovative technologies which have the potential to reduce project costs, conserve beach quality sand, extend the life of beach nourishment projects, and improve inlet sand bypassing. The Department, in ranking annual funding priorities of the beach erosion control program, considers the use of innovative, cost-effective, and environmentally sensitive applications to reduce erosion.

An innovative technology workshop was conducted by the Department in February of 2006. During this workshop, innovative technologies were presented to the Department. The Department explained the applicable rules and statutes to the interested parties as well as presented the procedures for obtaining regulatory approval from the Department. The proceedings of the workshop may be found at http://dep.state.fl.us/beaches/workshop.htm.

During 2006 and 2007, the Department formed an independent committee of coastal engineers and scientists to review and select innovative projects to be funded through a specific legislative appropriation in FY2006-2007 based upon an evaluation of proposals. Funds are to be used for the design, permitting, construction, and monitoring of demonstration projects. Projects selected for funding were determined by the committee to have the potential to be economically viable when compared to conventional technology and expected to optimize the management of sediment, or some other erosion control system, and project performance. Two projects currently being considered are a submerged low profile groin system in the City of Flagler Beach and an erosion control structure offshore of Brevard County.

Projects for examining the use of new approaches for beach management techniques are listed in the following table.

Project Name	Location	Date	Status
Artificial Seaweed	Collier County, Manatee County, and Palm Beach	Early 1980's	Ineffective and non-functional.
Beach Builder Screws	Flagler County	1985	Ineffective in moving sand and discontinued.
Beach Dewatering	Flagler County	1988	Results of the installation were inconclusive.
Undercurrent Stabilizers	Collier County	1984	No substantial beneficial effect on sediment accretion rates.

Prefabricated Erosion Prevention Reef (PEP) I	Town of Palm Beach	1987	Project had little, if any beneficial effect on the beach landward of the structure and was ordered removed.
PEP II	Town of Palm Beach	1991	Project determined to be causing erosion.
Biodune	St. Johns County and Brevard County	1986 and 1988	The Biodune synthetic gel composite did not affect coastal processes. Vegetation had difficulty establishing in the dune. Breaches in the dune toe rendered the product ineffective.
Aragonite Nourishment Project	Fisher Island, Dade County	1990	Overall shoreline location and beach planform have remained stable.
Longard Tubes	Sand Key, Pinellas County	1992	Project performed well to stabilize the beach as temporary groins until construction of large-scale beach restoration project.
PEP Reef	Indian River County	1996	Results of the installation inconclusive.
Net groin study	Naples, Collier County	2000	Results of the installation inconclusive.
Net groin study	Okaloosa County (Eglin Air Force Base)	2001	A third party peer review of the results of this test project indicated that this system did not meet the performance expectations and was not cost effective.
Porous groin study	Inlet Beach, Walton County	2004	Review of results is ongoing.
Submerged geotube groin field	Stump Pass, Charlotte County	2005	Resulted in shoreline retreat and was ordered removed.
Recycled glass sand demonstration project	Broward County	2006	Test plots were installed on the upper beach in the summer. The next phase of testing in the surf zone is scheduled for 2008.
Pressurized Equalizing Modules (PEMS)	Town of Hillsboro Beach, Broward County	TBD	PEMS installed in March of 2008.

EMERGENCY RESPONSE

If the Governor declares a shore erosion emergency, the Department may spend limited state funds to alleviate shore erosion. Also, there may be federal public assistance funds to help cover the costs of emergency response work and storm damage recovery. To expedite the use of available funds, the Department recommends that local sponsors develop emergency response plans for post-storm recovery and emergency beach maintenance. These plans should include a damage assessment methodology, preliminary plans and

contract documents for storm damage recovery work and emergency protective measures, applications for emergency permits and authorizations, sources of sand that will be used for beach and dune reconstruction, and identification of a secure source of funding for the local share of recovery costs. The Department also recommends that communities document ongoing programs they have to monitor and maintain their beach and dune systems; this documentation may help determine the scope of eligible recovery work if federal public assistance is available after a disaster event. Following Hurricane Opal in 1995 and the 2004 Hurricane Season, the Department created recovery plans which focused on projects to be constructed prior to the next hurricane season. The Recovery Plans identified projects which would provide a reasonable level of protection to the upland along the areas impacted, and were meant to be coordinated by all levels of government in the most efficient manner possible.

REFERENCES

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